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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/584,698

05/25/2007

Christian Belouet

979-237

7987

39600

7590

10/14/2009

SOFER & HAROUN LLP.

317 MADISON AVENUE, SUITE 910

NEW YORK, NY 10017

EXAMINER

BELYAEV, YANA

ART UNIT

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/584,698	Applicant(s) BELOUET ET AL.	
	Examiner YANA BELYAEV	Art Unit 1791	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 22 June 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-14 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-14 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 22 June 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>6/22/06</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 1-14 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1 is indefinite because the phrase, "substantially vertically close (page 4)" with regards to the edge control element is indefinite. This is because the phrase "substantially close" is not given with regards to any reference, thus it is too broad.

Claim 8 is indefinite because the phrase, "situated close to the bottom (page 6)" with regards to the orifice is indefinite. The interpretation of "close to the bottom" is not given with regards to any reference, thus it is too broad.

Claims 9 and 10 are rendered as being incomplete for omitting essential structural cooperative relationships of elements, such omission amounting to a gap between the necessary structural connections. See MPEP § 2172.01. The omitted structural cooperative relationships is the relationship between "the plate" and the rest of the apparatus. For purposes of examination it is interpreted that the plate is the part of the slot which is perpendicular to the plane of the support.

Claim 11 is rendered as being incomplete for omitting essential structural cooperative relationships of elements, such omission amounting to a gap between the necessary structural connections. See MPEP § 2172.01. The omitted structural cooperative relationships is the

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relationship between “a disk” and the rest of the apparatus. For purposes of examination it is interpreted that the disk is incorporated into the plate (interpretation of the plate is given above).

Claims 2-7 and 12-14 are dependant claims and are rejected for the same reasons as above.

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1-3, 6-7, 9-10, and 13-14 are rejected under 35 U.S.C. 102(b) as being anticipated by WO 01/04388 (Janoch hereinafter).

Regarding claims 1-3, Janoch discloses depositing a layer based on crystalline silicon onto a substantially plane, elongate, moving support having two longitudinal faces and two longitudinal side edges (page 13, lines 21-23 through page 14, lines 1-10, and Figure 7), the device comprising:

A crucible containing a bath of molten silicon, said support being designed to be dipped at least in part in the bath and to pass substantially vertically in its long direction through the equilibrium surface of the bath (page 13, lines 21-23 through page 14, lines 1-10, and Figure 7);

Two edge control elements (one on each side of the support (element 78, Figure 3b)), each edge control element being maintained substantially vertically close to one of the two longitudinal sides edges (page 11, lines 6-12 and Figure 3b, element 72), wherein “substantially vertically close” is indefinite (see above) thus the examiner has interpreted that the edge control

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element (element 72) is substantially vertically close to the one of the side edges of the support (element 78);

each edge control element comprising walls defining a longitudinal slot beside the corresponding side edge, wherein the longitudinal slot is interpreted by the examiner to be formed by element 72 and the inner walls of element 71 in Figure 3b, each slot being dipped in part in the bath so as to raise the level of the bath by capillarity in the vicinity of the corresponding longitudinal side edge (page 5, lines 6-12 and page 11, lines 8-10),

wherein at least one of the walls (referred to as insertion walls) facing part of one of the longitudinal faces is substantially plane (page 11, lines 7-8 and Figure 3b, element 72),

wherein the insertion walls are parallel since Janoch discloses that the vertical walls are places perpendicular to the plane of the ribbon (page 11, lines 7-8).

Regarding claims 6-7, Janoch discloses that the crucible has a bottom and side walls (element 71, Figure 3b), and each of the edge control elements being stationary and held vertically by the bottom and forming a monolithic structure with the bottom (page 11, lines 10-11).

Regarding claim 9, Janoch discloses that each of the edge control elements comprises a plate including a slot (page 11, lines 7-10 and Figure 3b, element 72), the plate being brought into contact with the equilibrium surface of the bath (Figure 3b).

Regarding claim 10, Janoch discloses that contact with the surface of the bath takes place by means of a connection between the plate and displacement means external to the crucible, and preferably allowing vertical displacement only (page 14, lines 11-17).

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Regarding claims 13 and 14, Janoch discloses that each edge control element is made of graphite (page 10, lines 10-11).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

5. Claims 8 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Janoch in view of US Patent 4,520,752 (Belouet hereinafter).

The teachings of Janoch are detailed in the rejection of claims 1-3, 6-7, 9-10, and 13-14 under 35 USC 103(a) above.

Regarding claim 8, Janoch does not disclose that each of the edge control elements presents at least one orifice dipped in the bath and suitable for feeding silicon to the element.

Belouet, in a similar field of endeavor, discloses channels (Figure 6, elements 15 and 16) which are dipped in the bath and suitable for feeding silicon to the element (column 2, lines 59-

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64 though column 3, lines 1-5) and situated close to the bottom (Figure 6), wherein "close" is interpreted by the examiner to mean that the channels are located towards the bottom of the slot and closer to the bottom of the crucible than the middle or top of the crucible.

While Belouet does not disclose the size of the orifice, it would have been obvious to one of ordinary skill in the art at the time of the invention to have made the orifice in the range of a millimeter order since the support, the spacing between insertion walls, and the depth are in the millimeter order.

It would have been obvious to one of ordinary skill in the art at the time of the invention to have included orifices since it enables a crystallization isothermal which is rectilinear across the full width of the tape (Belouet, column 3, lines 6-9).

Regarding claim 11, while Janoch discloses that each plate has a disk including said slot (Figure 3a, element 52), Janoch does not disclose that each plate has an effective diameter greater than 10 mm, and preferably equal to about 12 mm.

However, Belouet discloses that it is possible to control the degree to which the liquid silicon rises up the channels by capillary action by varying the channel inside diameter (column 3, lines 10-13).

Thus it would have been obvious to one of ordinary skill in the art at the time of the invention to have optimized the effective diameter in order to control the degree to which the liquid silicon rises up the channels (orifices) (Belouet, column 3, lines 10-13).

6. Claims 4, 5, 12/9, and 12/10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Janoch in view of US Patent 4,616,595 ('595 hereinafter).

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The teachings of Janoch are detailed in the rejection of claims 1-3, 6-7, 9-10, and 13-14 under 35 USC 103(a) above.

Regarding claim 4, Janoch does not give a numerical value for the mean depth of each slot.

However, '595, which in a similar field of endeavor discloses, that the bath is 2 cm deep (column 2, lines 43-44).

Thus it would have been obvious to one of ordinary skill in the art at the time of the invention to have made the mean depth of the slot less than half of the depth of the bath to maximize the exposure of the support to the molten bath.

Regarding claims 5, 12/9, and 12/10, Janoch does not give a numerical value for the mean spacing between the insertion walls.

However, '595, which in a similar field of endeavor discloses slots which are half-circles (Figure 3). '595 discloses that the diameter of the slots is 2 mm (column 3, lines 26-30).

It would have been obvious to one of ordinary skill in the art at the time of the invention to have made the mean spacing between the insertion walls, or diameter, 2 mm since the structure disclosed by '595 is essentially the same structure as that disclosed by Janoch except for the shape.

7. Claim 12/11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Janoch in view of Belouet and further in view of '595.

The teachings of Janoch are detailed in the rejection of claims 1-3, 6-7, 9-10, and 13-14 under 35 USC 103(a) above.

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Regarding claim 12/11, neither Janoch nor Belouet give a numerical value for the mean spacing between the insertion walls.

However, ‘595, which in a similar field of endeavor discloses slots which are half-circles (Figure 3). ‘595 discloses that the diameter of the slots is 2 mm (column 3, lines 26-30).

It would have been obvious to one of ordinary skill in the art at the time of the invention to have made the mean spacing between the insertion walls, or diameter, 2 mm since the structure disclosed by ‘595 is essentially the same structure as that disclosed by Janoch except for the shape.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to YANA BELYAEV whose telephone number is (571)270-7662. The examiner can normally be reached on M-Th 8:30am - 6pm; F 8:30 am- 5 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Steven Griffin can be reached on (571) 272-1189. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Y. B./
Examiner, Art Unit 1791

/Steven P. Griffin/
Supervisory Patent Examiner, Art Unit
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